Remarks:

This amendment is submitted in an earnest effort to
advance this case to issue without delay.

The specification has been amended to eliminate some
minor obvious errors. No new matter whatsoever has been added.

The claims have been amended to overcome the §101
rejection by reciting the system in which the method works.

In addition claim 1 has replaced the expression "an
updated decoder version of at least a first and at least a second
type according to the type of record to be decoded" with by "an
updated decoder version of at least a first or a second type
according to the type of record to be decoded." Basis for such
amendment can be found in the description at page 4, lines 5-10,
"create an updated version of the GSM decoder (step 114) or GPRS
decoder (step 116) according to the type of record read in step
102. The type of decoder selected (114 or 116) according to the
parameter indicating the type of record (step 102) is further
parameterized..." and corresponding FIG. 2. Thus this feature is
fully supported by the original disclosure.

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With reference to the §103 rejection, on WO 2000/59199 of Anderson and the admitted prior art, a prima facie case of obviousness has not been established. Anderson does not teach all the claim limitations listed by the Examiner.

In particular, in the wording of claim 1, Anderson fails to disclose the operations of:

identifying the type of record to be decoded, the identification corresponding to at least a first type (GSM) and at least a second type (GPRS) of records to be decoded;

providing the formal description of the ASN.1 type of the records to be decoded;

self-generating by means of the interpreter and in relation to the aforementioned description, an updated decoder version of at least a first or a second type according to the type of record to be decoded; and

supplying the files to be decoded to the decoder self-generated in this way.

Anderson discloses a method of generating a bill image in a billing system for a telecommunication network which includes a discount for a customer applied to calls made during a billing period to which a discount scheme applies. The system is of course capable of processing Charging Data Records (CDR), as it calculates discounts by obtaining the call types that qualify for the discount product, however it does not specify how CDR are processed.

The present invention deals with the problem of decoding
the Charging Data Records, in particular to provide solutions that
can decode both GSM and GPRS format records, and for solutions that
take into account the frequent updating of the record format after
the introduction of new GSM and GPRS network services/performances.
The solution, according to this invention, basically is the
automatic generation of the logic that encodes the records.
Whereas known solutions include the rewriting of the record
decoding software whenever variations are introduced by the MSC
manufacturer (Mobile Switching Center) or SGSN/GGSN (Serving GPRS
Support Node and Gateway GPRS support Node), the solution according
to the invention simply requires the manufacturer to provide a
formal record description of the ASN.1 type (Abstract Syntax
Notation One). The solution then uses this description to directly
generate the code and decodes the data record.

Nothing like this is seen in the cited reference. The
amended claims clearly define an invention that is patentable over
the cited art. Notice to that effect is earnestly solicited.

If only minor problems that could be corrected by means
of a telephone conference stand in the way of allowance of this

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case, the examiner is invited to call the undersigned to make the necessary corrections.

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Enclosure: Extension (two months)
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                Clean Specification

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METHOD AND SYSTEM FOR DECODING CHARGING

DATA RECORDS IN MOBILE TELEPHONE NETWORKS AND THE RELATIVE SYSTEM

CROSS REFERENCE TO RELATED APPLICATIONS

This application is the US national phase of PCT application PCT/EP03/01978, filed 26 February 2003, published 18 September 2003 as WO 2003/077527, and claiming the priority of Italian patent application TO2002A000201 itself filed 8 March 2002, whose entire disclosures are herewith incorporated by reference. ~~Technical~~

FIELD OF THE INVENTION

The present invention ~~tackles~~ relates to the problem of decoding the so-called Charging Data Records (normally known by the acronym CDR) emitted by the nodes of a mobile telephone network.

BACKGROUND [[Art]] OF THE INVENTION

[[These]] Such charging data records are currently decoded by employing solutions based on software applications, which, for example, decode GSM network records separately from those of an associated GPRS network. Specifically, the application is developed manually starting from the record coding specifications, and each time there is a modification/new release of the GSM and/or GPRS systems and when new functions are added, parts of the software must be to some extent rewritten.

There is consequently a need to provide solutions that can decode both GSM and GPRS format records, and for solutions

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that take into account the frequent updating of the record format

after the introduction of new GSM and GPRS network services/per-

formances, as well as the possibility of easy extension of the

application to new functions such as UMTS. ~~This objective can be~~

5   ~~reached, according to this invention, by using a method that has~~

~~the features referred to specifically in the claims that follow.~~

~~The invention also refers to the relative system.~~

                        SUMMARY OF THE INVENTION

              The solution, according to this invention, basically

10   envisages the automatic generation of the logic that decodes the

records. Whereas known solutions include the rewriting of the

record decoding software whenever variations are introduced by

the MSC manufacturer (Mobile Switching Center) or SGSN/GGSN

(Serving GPRS Support Node and Gateway GPRS Support Node), the

15   solution according to the invention simply requires the

manufacturer to provide a formal record description of the ASN.1

type (Abstract Syntax Notation One).

              The solution, according to the invention, then uses

this description to directly generate the code that decodes the

20   data record. As a result, the decoder adaptation times can be

cut from several weeks to a few days, making it easy to keep

right up to date with the mobile network's frequent alterations.

              The solution, according to the invention, includes the

decoding of GSM records and GPRS records, which means that a

25   single tool can be used on a mixed network employing both

technologies. This is particularly advantageous if [[you]] <u>one</u>

considers that the operators of large-scale mobile telephone

networks use both technologies in the network, in conditions in

which the network update is carried out asynchronously.

The solution, according to the invention, proposes to

5   decode the data records for GSM and GPRS functions, but its main

features also make it easy and quick to extend the solution to

other functions such as UMTS.

BRIEF DESCRIPTION OF DRAWINGS

The invention is hereafter described, by way of a non-

10   limiting example only, with reference to the annexed drawings

wherein: [[-]]

Figure 1 is a functional block diagram illustrating the

general architecture and the input/output/control relationships

of a system that operates according to the invention, and [[-]]

15   Figure 2 is a flow diagram illustrating the main stages

into which the method is divided according to the invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

As shown in Figure 1, the illustrated system, referred

to with the number 10, has a main element, which is a processing

20   core 12, destined to input a file 14 to be decoded [[14]], which

then outputs a corresponding decoded file 16. The system 12

works on the basis of a decoding logic that is directly self-

generated from the formal description ASN.1 contained in a file

20 received from the outside. As already known, the description

25   of the records in ASN.1 (or equivalent, and consequently a

description "of the ASN.1 type") constitutes a set of

specifications that describe the coding format of the records in ASN.1 Notation or equivalent.

The input or log file 14 contains the records generated by the real network equipment (MSC for GSM records or SGSN/GGSN

5   for GPRS records) in coded hexadecimal format.

The decoding operation is run on the basis of the set of user parameters that characterize the log file, the type of record (SGM/GPRS) and the output format.

In particular, starting from an initial step 100, the

10   first steps in the operating sequence of the system 10 include the reading of the parameters sent to output, which are: [[-]]

type of record to be decoded: GSM or GPRS (read by the system in step 102), [[-]]

name of the log file to be decoded (step 104), [[-]]

15   decoding format, i.e. the output format of the decoded file (read in step 106); this format may be "long", when the decoding, the length and the contents in hexadecimal are given for each record field, or "short", when only the decoding is given

20   for each record field, [[-]]

log file containing the records to be decoded (step 108), and [[-]]

formal record description of the ASN.1 type (step 110).

Depending on the record description, an interpreter,

25   such as an ASN.1 interpreter, included in the processing core 12 (see block 18 in Figure 1) creates and runs a series of

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procedures (collectively referred to as 112), which in terms of a self-generation operation, create an updated version of the GSM decoder (step 114) or GPRS decoder (step 116) according to the type of record read in step 102.

5   The type of decoder selected (114 or 116) according to the parameter indicating the type of record (step 102) is further parameterized according to the parameters read in steps 104 and 106 (log file name and decoding format).

          Once the decoder has been updated and programmed, it
10   inputs (step 118) the file 14 containing the records to be decoded, and then outputs (step 120) the file containing the records decoded in text format. Reference 122 indicates the final step in the procedure.

          Naturally, numerous changes can be made to the
15   construction and embodiments of the invention envisaged and illustrated herein, without however departing from the scope of the present invention.

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